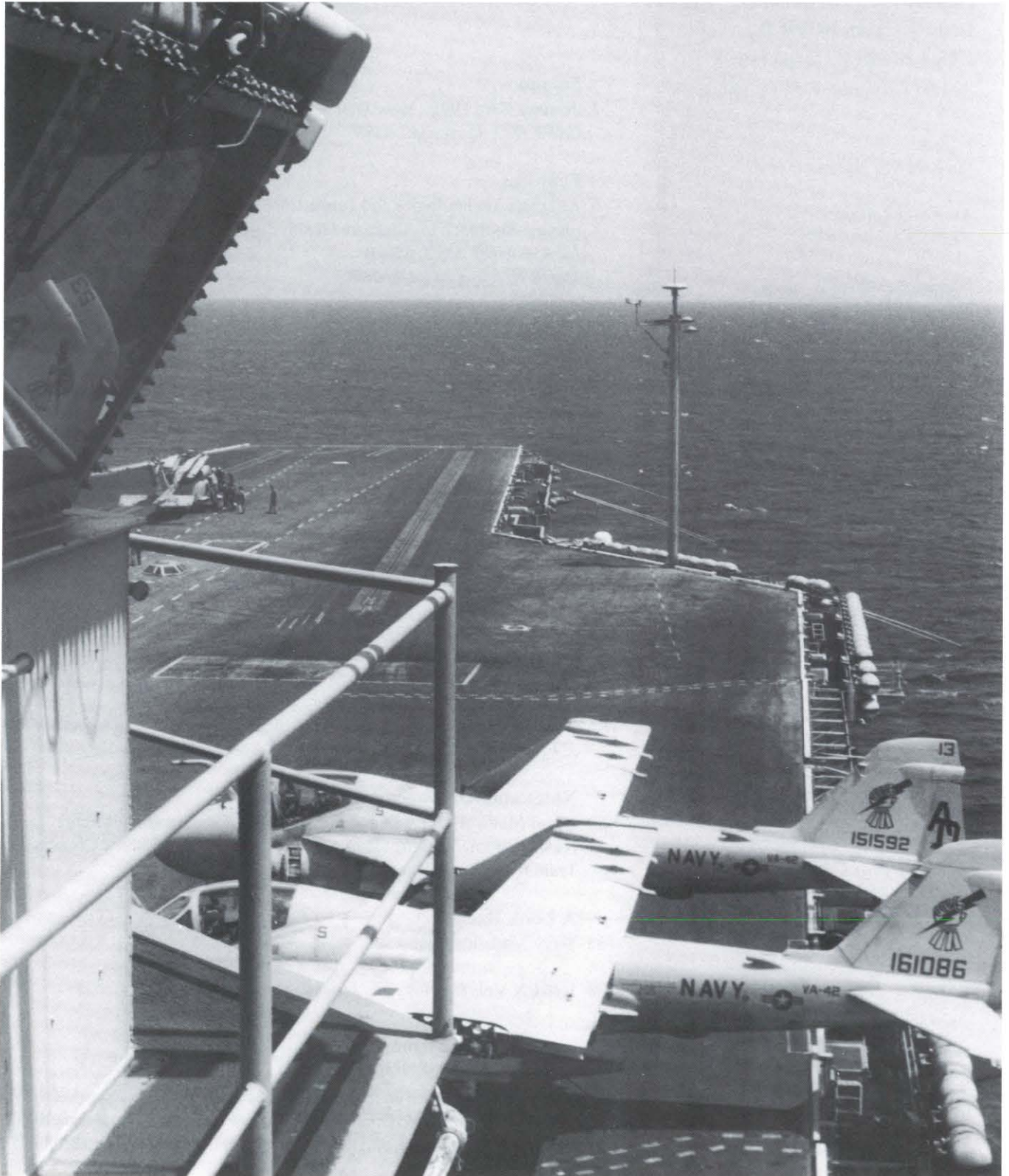


NAVY MEDICINE

November-December 1994



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COVER: Looking down on the flight deck of USS *Theodore Roosevelt* (CVN-71) from the bridge. *Navy Medicine* reports on how the carrier handles medical waste storage, industrial hygiene, and the HICS program. Story on page 12. Photo by the Editor.

Primary Care 1995:

How Will We Do It

CAPT David G. Kemp, MC, USN

Whether enacted in law or resulting from market forces, the United States is now beginning to experience major changes in the organization and delivery of health care. The mantra of health system reform goes "cost, access, quality." For individual patients, however, issues of cost and quality cannot be addressed until access is secured. For this reason, we must address access as soon as possible.

Almost all managed care systems use primary care as the preferred method of access. In Navy medicine, the beneficiary is a person entitled to care. Access is the implementing action which transforms the beneficiary into a patient! Gaining reliable and timely access to needed care is one of the major problems facing our beneficiaries today. If Navy medicine intends to play a role in a competitive, pluralistic national health care plan, it is necessary for us to begin to pay greater attention to primary care now!

The basis for the increased interest in primary care as the reform movement accelerates is the widely held perception that expanded primary care services will be more cost effective than existing practices and is therefore key to solving the access problem. It follows that a health system's design team must place great importance on designing efficiency into its primary care processes. Efficiency combined with quality produces value. I believe that health care delivery organizations which emphasize overall value and view quality "through the patient's eyes"(1) in addition to traditional, technically centered approaches to assessing quality, will become tomorrow's leaders.

Setting Our Sights

No sailor puts to sea without having a destination in mind. Storms, winds, and currents may cause the prudent sailor to deviate from his planned course, but the destination remains firmly in mind. Similarly, without a clear idea of what Navy primary care will be, we can't set a course to take a system which now offers care "as available"(2) into an era promising guaranteed access to health care. In this new era, Patient Centered Care(3) will likely become a major marketing strategy employed by organizations dedicated to achieving total quality.(4)

Defining Primary Care

Just what is primary care, anyway? Most of us have a personal perspective of what primary care is, but when it comes to defining primary care in operational terms,(5) the task becomes daunting. Unless the Navy Medical Department defines a primary care system in objective, measurable terms, we will never have that destination clear in our minds. Our actions will remain unfocused and our system will continue to lack a uniform standard of patient care from one location to another.

This is not radical thinking. It is nothing more than applying the "FOCUS-PDCA" approach to quality improvement that the Naval Medical Quality Institute (NMQI) has been teaching since 1990. As we address primary care, we must first set our "FOCUS" on defining the services that our patients will receive when they access Navy primary care. Once advertised to our patients, these services must be reliably provided if our patients are to truly trust us.(6)

Table 1
Qualitative Features of Primary Care

First Contact Care

Accessible Care

Comprehensive Care

Coordinated Care

Longitudinal Care

Continuity of Care

Managed health care requires more than a laundry list of tasks or services to define a primary care system. Starfield(7) has characterized the major qualitative features of primary care (Table 1). The most controversial of these is the degree to which a patient's contacts with the system are limited. If "First Contact" with a specified primary care provider is an absolute system requirement, that provider is often termed a "gatekeeper." While the effect of gatekeepers on quality of care remains controversial, it is less so where there is a long tradition of having a point of first contact. In systems where a gatekeeper is well trained in the recognition of the early stages of disease, enjoys no financial incentive from his/her actions, and has the ability to secure specialty referrals when requested, the gatekeeper concept is viewed as "rational organization" of care rather than "rationing." (8)

"Accessible Care," "Longitudinal Care," "Continuity of Care," and "Coordinated Care" are all system characteristics that relate to patient-provider and provider-provider interactions. "Accessibility" is a multifactorial measure of a patient's ability to obtain care. It includes location, office hours, and the ability to serve patients presenting without scheduled appointments. "Longitudinality" is a measure of the percentage of time a patient initiates an episode of care through the primary care facility. "Comprehensiveness" is a measure of the facility's ability to recognize problems of all types (organic, functional, and social) and to arrange for all types of health care services, including those not provided within the facility. This includes the ability to effectively

consult and refer as clinically indicated. "Coordination" (integration) implies that all pertinent information relating to a patient's problem is readily and reliably accessible to all providers caring for the patient, and is routinely used throughout the patient's episode of care. "Continuity" is a measure of how care is provided as an uninterrupted chain of events.

Taken together, these factors can be an effective starting point for developing a systems approach to primary care and a foundation upon which to develop parameters to assess service quality. Any treatment facility or system declaring that it offers "full service primary care" must be capable of evaluating, treating, or referring undifferentiated complaints brought by patients of all ages and both sexes. But, this broad scope of services is most often provided by a team of caregivers rather than a single individual.

The Influence of Structure

Today, Navy hospitals and clinics, with rare exception, are vertically structured by professional "domains of influence." In this vertical structure, doctors supervise the activities of other doctors, nurses supervise other nurses, etc. The organization of services in this structure accommodates the cultural traditions of the professional staff well. The medical needs of the patient may receive secondary consideration, however, when complex processes require cooperation among members of several corps holding divergent priorities.

The "vertical structure paradigm" has worked well for specialty centered health care delivery, for it builds tight teams of specialists who can focus their chosen body of knowledge on their patient's problem with great intensity and skill. But the evolution of specialty focus that has heightened our intensity of knowledge has also been accompanied by a progressive narrowing of the individual clinician's focus. Specialty trained providers are secure in that they can (or believe they can) master the entirety of their specialty's body of knowledge, and patients are secure in knowing that they are receiving the "highest quality care" when they are being treated for a specific disease.

But patients often present to the primary care practitioner with "signs and symptoms" (9) rather than defined diseases. The protean nature of their symptoms may be consistent with the early stages of many diseases that cross specialty boundaries. Moreover, symptoms often reflect a combination of functional as well as organic etiologies. The primary care practitioner must apply his knowledge of pathologic physiology and interpret the

clinical signs and symptoms across the entire spectrum of potential disease processes.

The knowledge and ability to think "horizontally" is the forte of the successful primary care practitioner and contrasts sharply in style with the practice paradigm of the specialist who devotes her/his major attention to diseases of one organ system and/or to mastery of the most difficult procedural skills. In specialty-oriented facilities, uncertainty may result in multiple consults and procedures of low yield.

There is a great deal of controversy over the type of provider best qualified to deliver primary care, or even if an emphasis on primary care will diminish the quality of care now provided by our specialty-oriented system. There is little objective data from health services research studies to answer these questions at this time. But "quality" has a different meaning(10) when applied to populations in contrast to individual patients. If DOD's total resources are balanced against the needs of the entire beneficiary population, a strong case exists for developing a more efficient and accessible system.

If Navy medicine is to shift its paradigm to a managed care concept with a primary care emphasis, major shifts in organizational values and culture must occur. This will be most difficult in our teaching hospitals. The risk of alienating specialists is significant, but change is essential if we wish Navy medicine to have a future in the care of beneficiaries who could receive their care by contracted civilian organizations. Studies have already detailed what a much smaller Navy Medical Department, restricted to a contingency-ready force, would look like.

We who are Navy medicine must choose. Continuing current practice patterns under a cloak of primary care verbiage is to fulfill the parable of "The Emperor's New Clothes." The following proposal would require commitment on the part of every member of our health care team. It would also require a continuing sense of purpose and commitment from leadership as leaders change at all levels of command. It anticipates and prepares us for direct competition in the near future with managed care organizations which will almost certainly bid on a great majority of the care now provided by uniformed personnel.

A Task-Based (Process-Oriented) Approach to Primary Care

A new view is emerging, one that demands our serious consideration. This concept of hospital management is horizontally structured, based on the needs of a patient presenting for care. The term "product line management"

is often applied to this concept, in which a "product line manager" is responsible for all elements of his/her product line (service), whether elements of the process are provided by physicians, nurses, technicians, or ancillary personnel. The activities of this team of professionals are structured to accomplish a defined series of tasks tailored to meet a specified portion of the medical needs common to unique groups of patients. For primary care, these tasks have been defined by Stoeckle(11) and are listed in Table 2.

Whether Stoeckle's list of tasks are accepted verbatim or modified is a function of the organization's senior leadership and its vision of primary care. The task list, once defined, however, sets the boundaries for the primary care product line of health services that the organization intends to offer to its beneficiaries.

Quality Considerations in Primary Care

Tasks may be accomplished in any number of ways, but some ways are clearly better than others. Before the organization begins to design the detailed processes that will be integrated to build a complete primary care product line, careful consideration must be given to establish the value parameters that will be built into the system. In the competitive environment which Navy medicine will

Table 2
Tasks of a Primary Care Doctor

Medical diagnosis and treatment
Psychological diagnosis and treatment
Personal support of patients of all backgrounds, in all stages of illness
Communication of information about diagnosis
Treatment, prevention, and prognosis
Maintenance of patients with chronic illness
Prevention of disability and disease through detection, education, persuasion, and preventive treatment

Table 3
Quality Characteristics of Primary Care

Ease and Reliability of Access
Continuity of care provided by a principal provider (or team)
Providers skilled in eliciting both the organic and psychosocial causes of symptoms
Providers use laboratory and imaging services judiciously
Providers integrate health care services other than primary care
Emphasis is placed on patient education

soon encounter, our system must possess qualities which will attract both patients and providers. To do that, we must understand and seek "true quality."

"True quality"⁽¹²⁾ characteristics derive from the perceptions and values held by patients, providers, and payers (our customers). The system must be "fitted" to their needs. This contrasts sharply from the traditional approach to medical quality which focuses on the technical (absolute) aspects of patient care. In the broader view of quality proposed here, we must consider all our customers and be prepared to incorporate their values into our operations. At times, patient's personal values may seem trivial to our physicians and other providers, but they can't be ignored. Our payers (ASDHA and CNO) can't be ignored either and their primary values are likely to be cost sensitive.

Table 3 lists some common quality parameters of primary care services.

Structuring Processes for a Primary Care Product Line

Once we have defined the tasks to be accomplished, established the dimensions of quality desired in the product line services, and assessed the available resources, it is time to undertake the task of building individual process elements into functional processes. This is a time to be realistic rather than theoretical. While the scope of services offered and quality parameters should be com-

mon across the system, local variations in patient population, staffing, and facility constraints require local initiative and innovation to build a functional unit. This task is best assigned under the direction of a single product line manager who will ultimately be responsible as the system's manager. The FOCUS-PDCA approach works very well in designing a new process (or series of processes) as well as its more common use in improving processes. While the details of process design are beyond the scope of this article, it should be clear that process design proceeds in a seamless evolution through implementation and continuous improvement phases. Since virtually all hospital operations are interdependent to some degree, the primary care manager must develop close managerial relationships with consultants and inpatient services. Allocation of resources among the various product lines must remain a command function.

Making Primary Care Efficient

Difficult challenges face every design team in the domain of efficient care. Facilities are often antiquated, construction money unavailable. Billeted staff may not be "current and competent" in the basic tasks of primary care nor interested in gaining primary care skills. Budget constraints minimize opportunities to train and supplement staff, remodel facilities, and upgrade equipment. Portions of the primary care system not possible to produce within the system may have to be contracted. Ingrained cultural attitudes about efficiency will be difficult to modify.

The distinction between process efficiency and personal productivity must be emphasized. If a primary care product line relies upon forced provider productivity to secure increased output, it will do little more than drive quality professionals out of the system. Efficiencies gained through process and system improvement, in contrast, will retain quality professionals. Table 4 lists a few efficiencies common to civilian managed care systems which are often not characteristic of Navy primary care clinics.

There are plenty of civilian-managed care organizations now providing excellent quality, efficient primary care. We do not need to reinvent the wheel entirely, but can benchmark our operations against the best in existence, adapt their successful characteristics to our unique position as a contingency-ready force, and build a primary care product line second-to-none. The tasks which characterize the basic primary care patient-provider interaction are the same in the Navy as in a managed care organization.

Table 4
Creating Efficiency in Primary Care

Clinical staff capable of providing full range of primary care services at one site

Support staff/physical facility structured to maximize provider's efficiency

Laboratory, X-ray services available onsite during clinic operating hours

Medical records available and complete at time patients report for appointment

State-of-the-art clinical information system functional

Primary care staff enjoy responsive, collegial relationships with specialty staff

Primary Care Cannot Stand Alone

Reliable access to specialty care is equally important as access to primary care. In managed care, however, it is the primary care provider who accesses the specialist as an agent for his/her patient when secondary or tertiary care is required.⁽¹³⁾ The success of any primary care venture is highly dependent upon the willingness of specialty medicine to adopt the same Patient Centered Care paradigm that has been previously mentioned as necessary to achieve true quality in primary care.

Conclusion

In a downsizing military with an inevitable reduction in medical staff and budget, the future will likely require specialty services to be increasingly a tri-service function. The future of "Navy medicine" may indeed lie in primary care as "DOD medicine" encompasses the domain of specialty care.

How can we face change with its risks and opportunities and still retain our personal equilibrium as traditional autonomies are threatened by attempts to reduce variation through managed care efficiencies? My suggestion is to go back to the earliest days of our professional careers when idealism prevailed in our minds. Go back to putting

"what is best for our patients" as Job Number One and keep our minds open.

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1. Gerteis, Degman-Levitan, Daley, Delbanco. *Through the Patient's Eyes*. Jossey-Bass Publishers; 1993.
2. Title 10, U.S. Code, which governs care provided to all classes of beneficiaries excepting active duty personnel.
3. Patient Centered Care is a concept being extensively developed through the Picker/Commonwealth Fund. Extensive, ongoing research has been under way since 1988 to develop this concept, which is yet largely unknown among Navy medical planners.
4. Total quality concepts universally accept that the customer determines the definition of quality. Professions viewing themselves as having a fiduciary role traditionally believe that the customer is incapable of judging quality. To rationalize the opposing views, one needs to carefully define "quality." The professional (fiduciary) view emphasizes "technical quality." The "total quality" definition includes both technical and service quality.
5. Deming WE. *Out of the Crisis*. Massachusetts Institute of Technology, Center for Advanced Engineering Study; 1989:276-278.
6. Ishikawa K. *What is Total Quality Control? The Japanese Way*. Prentice-Hall Inc; 1985:74-76. In this text, Ishikawa differentiates between quality control and quality assurance, emphasizing that "assurance" requires a sense of trust and confidence between the customer and the system providing products or services, established over a long period of time.
7. Starfield B. *Primary Care: Concept, Evaluation and Policy*. Oxford University Press; 1992.
8. Ibid., pp 27-30.
9. The Preface to the First Edition of Cyril Mitchell MacBryde's text, *Signs and Symptoms*, begins: How convenient it would be for the physician if the new patient were able to announce: "I have a gastro-intestinal disturbance," or, "My trouble is nephritis." A perusal of the usual textbooks of diagnosis or of medicine would lead one to believe this might be the case, for "intoxications," "deficiency diseases," "metabolic disease," "respiratory diseases", and so on, in rigorous order, as though every sick person carried his presumptive diagnosis labeled on his chest. Where in such textbooks can the doctor seek help when the patient confronts him complaining, for example, of severe epigastric pain, or of headache, or of jaundice?"
10. The parallel is obvious. How does the patient with headache know that he/she should report to the neurologist, ENT surgeon, psychiatrist, endocrinologist, or even the oncologist? One function of the primary care physician is to skillfully and efficiently navigate his patient's course of treatment through the specialty maze.
10. Lohr KN, Harris-Wehling J. Medicare: a strategy for quality assurance, I: a recapitulation of the study and a definition of quality of care. *Qual Rev Bull*. 1991;17:6-9.
11. Stoeckle J. In: Goroll AH, May LA, Mulled AG Jr. *Primary Care Medicine*. 1987:1-5.
12. Ishikawa K. *What is Total Quality Control? The Japanese Way*. Prentice-Hall Inc; 1985:46-49. A full discussion of the difference between "true quality characteristics" and "substitute quality parameters" is beyond this article. This important differential is clearly discussed in this reference.
13. Some would argue that primary care physicians are not qualified to decide when specialty care is appropriate. It is incumbent upon the system to ensure that primary care practitioners are expert in this critical task. Too much consultation results in inefficiency; too little in poor quality care. Most would agree that Navy general medical officers, with 1 year of postgraduate education, do not possess the full range of skills required of a true primary care physician as described in this article. □

Dr. Kemp is the Surgeon General's Specialty Advisor for Internal Medicine.

Alternate Technologies and Home Care Service (ATHCS):

An Interdisciplinary Approach to Alternate Health Care

LT Ron Gimbel, MSC, USNR
LCDR Karolyn Ryan, NC, USNR-R

The mission of the Alternate Technologies and Home Care Services (ATHCS) program at Naval Hospital, Charleston, SC, is to provide nonformulary medications, routine and unique medical supplies, and short-term use durable medical equipment (DME) to support cost-effective care in alternative settings. This saves government dollars, reduces the length of hospital stays, and improves patients' quality of life.

The ATHCS program, developed in 1991, is funded through alternate use of CHAMPUS funds. It targets high cost CHAMPUS patients being discharged from an inpatient setting or receiving care through an outpatient environment. Since inception,

the program has grown significantly from 8 patients to a current census of 90 patients. Active duty personnel and a limited number of Medicare patients have been included under special circumstances, but are funded by the Naval Hospital's Supplemental Health Care budget.

Prospective program participants are identified through several sources including the fiscal intermediary (Blue Cross/Blue Shield) case management coordinator, direct contact with CAMCHAS (Catchment Area Management System Charleston) preferred civilian health care providers, local community hospitals, our discharge planner, and patient self-referral.

Staffing

In compliance with Joint Commission on Accreditation of Healthcare Organizations (JCAHO) standards, program management control and direction is provided by an executive-level governing board. Operational responsibility rests with the Head, Alternate Health Care Department. Staffing for the program has grown commensurate with program size and function. The current full-time staff consists of a clinical pharmacist (GS-12), a home health nurse (GS-11), and a pharmacy technician (GS-05). The ATHCS administrator (LT/MS) and physician advisor (CDR/MC) assume their role on a collateral basis. Other members of the Alternate Health Care

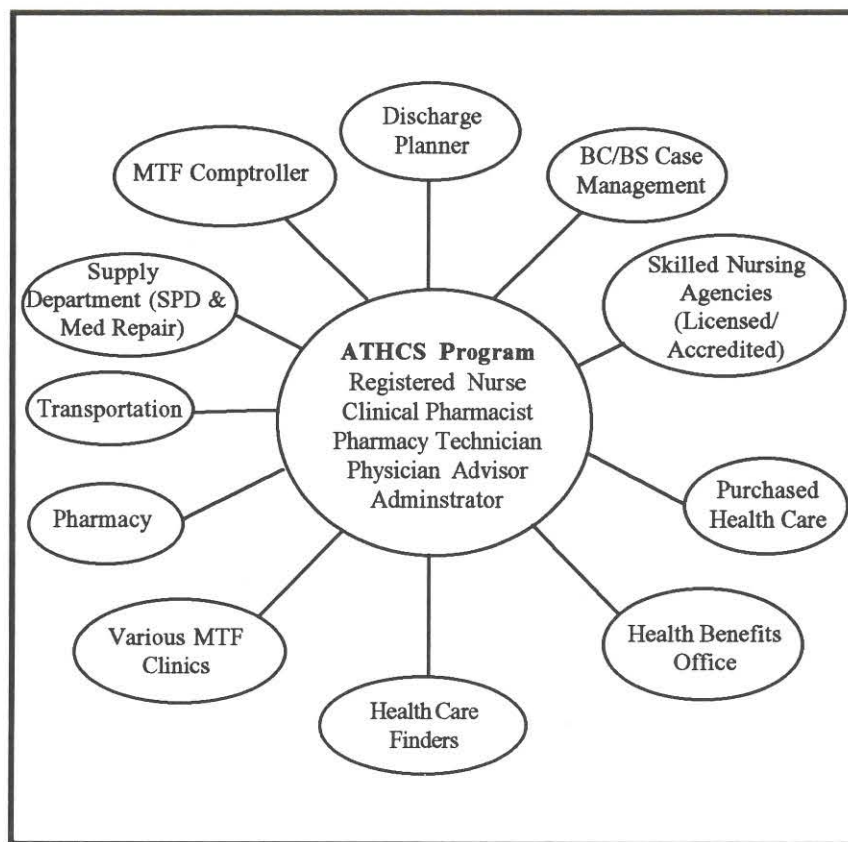


Figure 1

Department, while not considered ATHCS staff, play a significant role in the success of the program. They include the hospital discharge planner, the Blue Cross/Blue Shield case management coordinator (indirect reporting relationship), health care finders, health benefits advisors, and purchased health care personnel. External to the Alternate Health Care Department are additional staff who provide critical support. They include the Comptroller, the Transportation Division, the Pharmacy Department, Materials Management Department (for supplies and biomedical equipment repair), and various specialty clinics.

A decision was made early in the program development to co-locate the ATHCS and Alternate Health Care offices physically adjacent to each

other (where possible). In an effort to bring together both social and clinical skills, the registered nurse and discharge planner share an office. This interdisciplinary integration and co-location has enhanced communication between staff and resulted in more efficient use of time and resources. Figure 1 identifies direct and indirect staff involvement in the ATHCS program.

Services

As with any new program, the scope of services provided is continually being refined. Table 1 outlines the services currently being offered through the ATHCS program. The program does not provide on-site or in-home nursing care, but instead refers to local accredited skills nursing agencies (on a rotating basis) who

TABLE 1
ATHCS Services

Intravenous Antibiotic Therapy Intramuscular Injections Total Parenteral Nutrition (TPN) Hospice Care Wound Care Catheter Placement or Changes Ventilator Support Durable Medical Equipment Patient Education Pharmacy Services Negotiation of Discounts Intravenous Hydration Chemotherapy Nebulizer Treatments Enteral Feeding Equipment and Supplies Ostomy Support Patient Controlled Analgesia (PCA) Growth Hormone Treatment Albumin Infusion Immunoglobulin/Transplant Support

actually perform the necessary care. Required medication, supplies, and/or DME are relinquished to the patient directly, to his/her family member, or to the nursing agency (as appropriate). If necessary, deliveries of medication and/or supplies from the Naval Hospital to the patient's home are made by the transportation services of Naval Hospital Charleston.

Financial Information

Prior to the implementation of cooperative care, the program focused exclusively on CHAMPUS patients who were being treated by civilian providers. Now, the program has been extended to include CHAMPUS beneficiaries being followed by MTF (military treatment facility) providers who have unique nonformulary or home health requirements. When non-CHAMPUS patients (active duty/Medicare) utilize the program, their expenses are funded through MTF Supplemental Health Care funds. Due to the administrative structure of the program, ATHCS patients are not subject to CHAMPUS deductibles and copayments thus reducing the patient's out of pocket costs for services rendered (except skilled nursing care).

The ATHCS has proven to be a cost-effective solution to alternate care. The methodology for assessing cost savings is as follows:

CHAMPUS Maximum Allowable Charges for supplies and prevailing meds (cost avoidance)

<less>

MTF supplies and medications (variable cost)

<less>

TAD, salaries, equipment, and supplies.

Net Savings

In FY93 the ATHCS program boasted a total cost avoidance (net savings) of \$391,983. For the first 6 months of FY94, the program savings was \$232,630. Perhaps more significant than gross savings is total return on investment (ROI). Although the ROI has fluctuated since program inception (due to equipment procurement and additional salaries) the average ROI has been 2:1. Currently, the program exhibits an ROI of 2.24:1.

Looking to the Future

With emphasis on cost containment and a resurging interest on providing care in alternate settings, the ATHCS program is a practical way to maximize limited resources. The challenge for the ATHCS program at Naval Hospital Charleston will be to continue supporting program objectives in the midst of a significant reorganization of the command. In FY95 the hospital will be downsizing from its current inpatient capacity of 90 beds to a 40-bed facility with empaneled primary care teams. The emphasis for the future will not only be supporting inpatient discharge planning, but developing innovative mechanisms for supporting outpatient

initiatives. Specific ATHCS goals include:

(1) Adding the clinical component of ATHCS, where selected procedures can be accomplished on an outpatient basis within the MTF. Examples would include infusions, placing a PICC line, dressing changes, etc.

(2) Enhanced relationship with community home health organizations and community resources.

(3) Increasing program administration efficiency by procuring a hospital-based infusion software package which can automate cost comparison functions and reports.

(4) Prepare for JCAHO inspection in March 1995.

(5) Evaluate the potential for linking the third party collections program into the ATHCS.

Although this program is a pilot project at Naval Hospital Charleston, the basic concepts and principles could be applied to other MTFs. The program may prove especially useful in catchment areas, where MTFs are having difficulties accommodating the health care needs of their beneficiary population and therefore have high CHAMPUS expenditures. As demonstrated statistically, the ATHCS program is cost effective for both beneficiaries. □

LT Gimbel is Head, Alternate Health Care, Naval Hospital, Charleston, SC. LCDR Ryan is Administrative Officer, NRNH Charleston, Unit 1107.

Quality Improvement Shows a New Way at Orlando Branch Medical Clinic

LCDR Patricia Gamble, NC, USN

The Naval Hospital Orlando Branch Medical Clinic's Immunization Department sees approximately 2,000 recruits and administers 12,000 injections monthly. Recruit population is approximately 30 percent female. In 1992 the clinic reported nine uncontrolled falls secondary to syncopal episodes. From January 1993 to May 1993, six more uncontrolled falls were reported. A quality improvement study was initiated in June 1993 to identify the type of syncope presenting and to explore possible preventive measures. Clinic corpsmen under the supervision of the registered nurse/department head conducted the study. Between June 1993 and December 1993, a total of 43 syncopal episodes were documented and analyzed (see Table 1). Results suggested that most syncopal episodes resulted from hyperventilation and anxiety. Clinic corpsmen began to modify preimmunization procedures in an effort to relax recruits and decrease anxiety. Modifications included:

- (1) Permit recruits to sit rather than stand during preimmunization briefing.
- (2) Permit recruits to make lavatory call prior to immunization.
- (3) Encourage company commanders to leave the area until the immunizations are complete.
- (4) Encourage oral fluid intake before immunizations.
- (5) Permit recruits who feel particularly "nervous" to step out of line for a short period.
- (6) Place two large fans in the immunization spaces to relieve stuffiness when large numbers of recruits are on board.

The last uncontrolled fall in the Immunization Clinic occurred in July 1993. Although Hawthorne Effect cannot be ruled out, it also seems probable that comfort measures have decreased anxiety, hyperventilation, and uncontrolled falls. Staffing, types of vaccines, and overall immunization routine have not been altered. Modifica-

tions have not resulted in additional cost nor compromised efficiency. On the contrary, the staff spend less time caring for injured recruits, generate fewer incident reports, and return recruits to training more quickly. Patient satisfaction is high and recruits overwhelmingly praise the staff for being so "fast and organized." □

TABLE 1
Analysis of 43 Syncopal Episodes Occurring
During Recruit Immunizations between
June 1993 and December 1993

Systolic BP less than 100 mmHg	1
Irregular Pulse	1
Loss of Consciousness	10
Dyspnea/Wheezing	2
Diaphoresis	9
Nausea/Vomiting	11
Extremity Numbness/Tingling	21
Loss of Sphincter Control	0
Fall	2
Injury	2
Premonitory Signs	11
Confusion	5
Syncopal History	7
Allergy History	9
Pulse less than 60 BPM	4
Female	20
Male	23

When this article was written Lcdr Gamble was Department Head, Immunizations Branch Clinic, Naval Hospital, Orlando, FL. The following personnel also contributed to this project: HM3 Rodolfo Aponte, HM3 John Renner, HN Michael Ratay, HN Fred McGinnis, HN Jason Hunter, HN Guinnivere Craig.

Right: MRT on board USS George Washington (CVN-73) assembles in main medical to respond to an emergency. Opposite page: MRT conducts patient assessment in the hangar bay.



Shipboard Medical Emergency: Away the Medical Response Team

CDR Bruce Bohnker, MC, USN (FS)
LCDR Richard Welch, NC, USN (SWMDO)

The large aviation capable ship is a concentrated aerospace-industrial complex with the potential for a diversity of medical emergencies.(1,2) Multiple casualty situations come to mind most often, but the medical response to the individual patient with injury/illness is equally challenging and much more common. Ashore, facilities are supported by emergency medical technicians (EMTs) in ambulances who respond to such emergencies.(3) Afloat, the aircraft carrier must depend upon the medical response team (MRT) with capabilities including on scene evaluation, stabilization, initial treatment, and transport back to main medical. These functions are a criti-

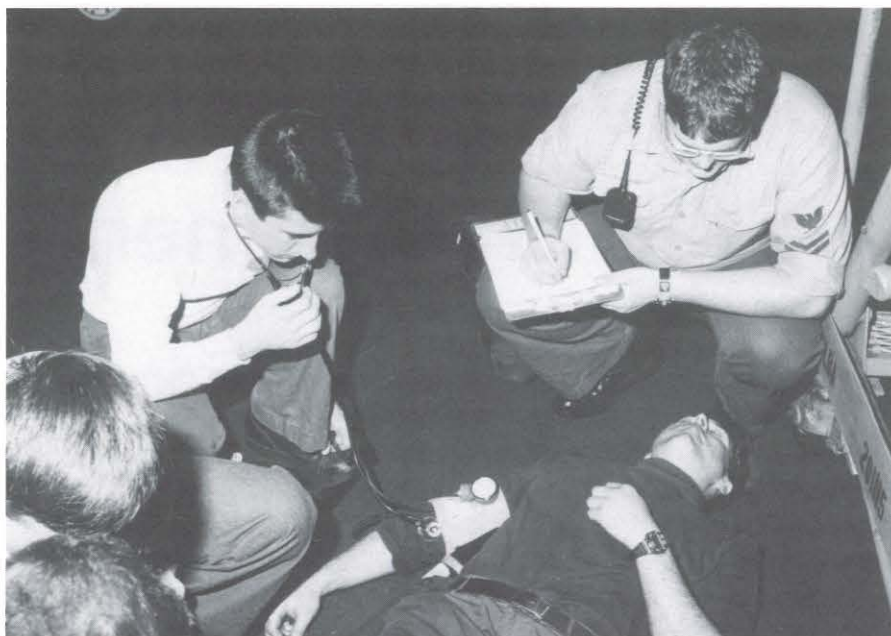
cal aspect of the medical department's readiness under the shipboard medical casualty response doctrine. The expected care approaches the standard found at a shore-based medical treatment facility.

Corpsmen volunteer to serve on the medical response teams in addition to other departmental responsibilities. Many corpsmen assigned to the MRT have completed EMT certification, some from the approved syllabus conducted by carrier medical departments. Training must hone and refine skills learned in EMT class with drills daily at sea and three times a week in port. MRT training is supervised by the ship's nurse serving as training officer and indepen-

dent duty corpsmen (IDC).(4,5) Realistic scenarios are used, building in complexity in order to "stress" the team and assess their capabilities.

When a medical emergency is called away over the ship's 1MC (loudspeaker) system, the first medical responder, or "rabbit," proceeds directly to the scene. There, he provides a rapid assessment and stabilization of the injured/ill sailor using a trauma bag, and may request additional assistance via radio. As the "rabbit" is enroute, the remainder of the MRT members muster in main medical, distribute their equipment, and proceed to the scene.

The MRT includes a team leader and three to four additional corps-



men, with a medical officer attendant (if needed). Equipment includes airway management, IV fluids, oxygen delivery, suction, immobilization gear—both c-spine and larger, dressings, and limited medications (Table 1). This equipment is grouped into corpsman-transportable packages with each corpsman responsible for his equipment including daily checks for completeness and currency of medications. Communications with main medical is an important part of the MRT and is maintained with radio, telephone, sound-powered phone, or by messenger. This communication allows additional assets to be dispatched if needed.

MRT actions are complex and require support from the entire ship. The embarked Marine Detachment (MARDET) provides assistance in patient transport and maintains a close working relationship with the medical department. The Master-At-Arms (MAA) force provides security to clear the scene and prepares the route back to main medical. The weapons department mans up the weapons elevators which transport the patient vertically from the flight

TABLE 1
Pack 1: Jump Bag with tourniquets, battle dressings, sphygmomanometer, stethoscope, air splints, and IV equipment.
Pack 2: Airway Bag with oral and nasal airways, O ₂ masks, D-sized cylinder, bag-valve-mask device, portable suction unit with suction tips/tubing.
Pack 3: Defibrillator/monitor, cables, paper, defibrillating gel, electrodes.
Pack 4: SPARKS Kit with appropriate advanced cardiac life support medications, clipboard with run sheets for documentation.

deck down to the level where main medical is located.

Medical emergencies deep in the ship may require lines and manpower from the At-Sea Fire Brigade to lift patients through the vertical trunks. Medical responses to the deep shipboard voids pose significant problems. Medical emergencies on the flight deck require coordination with the air department and the flight deck corpsmen. MRT response to a ship in

company demands complex coordination with the operations department, embarked aircraft squadrons, and the officer of the deck.

The carrier medical departments have two MRT teams which must be able to respond anywhere on board within 4 minutes. The primary team will respond to the scene of the emergency while the secondary team will man the ship's emergency treatment room and prepare to receive the casualty. Type commander (TYCOM) assessments during workups evaluate response to simultaneous emergencies at separate locations throughout the ship to evaluate this capability. Evaluation of the MRT function is a vital aspect of workup training.(6)

The inherent dangers of the shipboard environment require properly trained and well equipped medical response teams. MRTs are an important function of the on board medical department and a major component of shipboard medical readiness capability. Corpsmen serving on MRTs are trained and equipped to respond to a variety of medically challenging situations, providing care for their shipmates.

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USS Theodore Roosevelt: Safeguarding the Environment

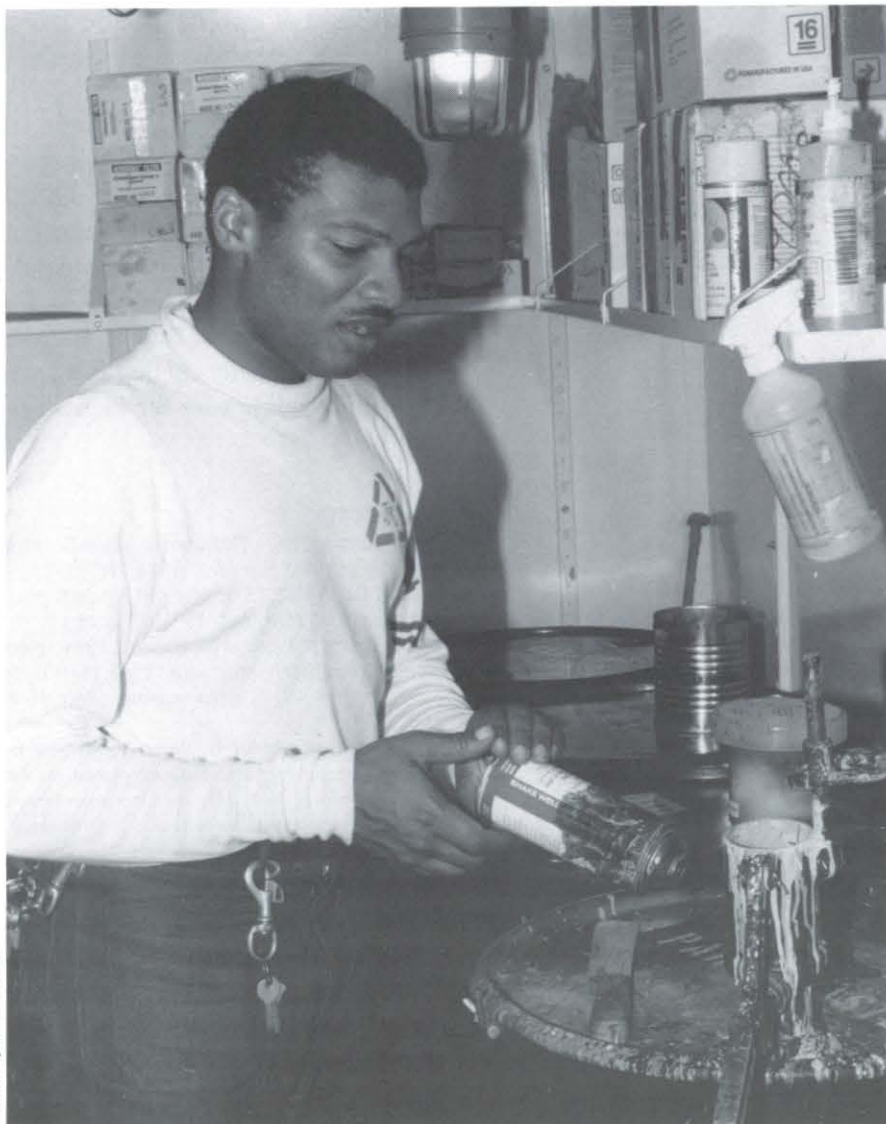
Providing a Safer, Healthier Workspace

David R. Klubes

Serving aboard a nuclear carrier in the U.S. Navy often has its moments of adventure and excitement; ports of call in different countries, watching an F-14 catapult off the deck at night with afterburners glowing, taking care of medical waste, food contaminated plastic waste, being in charge of the hazardous materials control system. Whoa, medical waste, plastics, hazardous material, what kind of adventure is this? Well, perhaps it's not, but far too often people focus on the more glamorous aspects of the Navy. Nevertheless, concentrating on the mundane details is absolutely critical. Ships are often very dangerous places to work and live. The flight deck of an aircraft carrier is some of the most dangerous real estate in the world. A failure to appreciate and respond to the potential dangers involved in running a ship can only lead to trouble.

Navy Medicine recently visited the USS *Theodore Roosevelt* (CVN-71) to examine how the Navy and the ship's medical and safety departments handle hazardous materials control,

SK2 Lajuan Calloway empties an aerosol can inside the HAZMAT trailer.



Photos by David Klubes

industrial hygiene, plastics and medical waste. The aircraft carrier provides the opportunity to study all these duties. A modern aircraft carrier, which combines all aspects of a floating industrial environment, aviation fuel farm, and airport, berths over 5,000 people during a typical deployment of some 6 months. Needless to say, the medical and safety departments get quite a workout keeping the crew healthy and in the process use a large quantity of medical and safety supplies. Much of the medical waste supply is nonreusable and must be stored until appropriately disposed of ashore.

Medical Waste Management

Medical (infectious) waste is of special interest to Navy medicine. The Navy has invested considerable time and energy to ensure that the highly publicized incidents in the 1980's, in which medical waste from Navy ships washed ashore, will not be repeated. In fact, the Navy has decided always to err on the side of caution to avoid even the perception that it disposes of its medical waste improperly. Medical and dental work together to coordinate their medical waste system. When the vessel is in port at Norfolk, the medical/dental personnel aboard transport the ship's medical waste to the Sewells Point Branch Medical Clinic. The clinic then disposes of *Theodore Roosevelt's* waste with its own.

While at sea, the medical and dental departments strictly comply with OPNAV and BUMED regulations. The Senior Medical Officer, CDR Gerald Scholl, MC, and the Senior Dental Officer, CDR Michael Huber, DC, say that they always go the extra step to keep the confidence level high.

They admit that some of the disposal procedures go beyond those of the civilian sector, but it is critical to eliminate any perception of wrongdoing by the Navy. *Theodore Roosevelt* burns what it can. However, any nonburnable material from the medical department is considered equivalent to infectious waste. This material is all kept aboard, autoclaved, labeled, logged, and stored.

A major dilemma is that the new rules no longer allow for the burning of plastics, latex, and rubber. Medi-

cal and dental generate large volumes of plastics and gloves. By definition, examination gloves are generally non-infectious medical waste. Often, in the civilian world it is acceptable merely to throw these gloves away. But now medical personnel must retain them aboard. During a long deployment, finding a place to store all the waste can become a major difficulty. The medical and dental departments aboard *Theodore Roosevelt* use a fan room to store medical waste once it is rendered noninfectious.



Medical waste being stored in a fan room.

Theodore Roosevelt's Industrial Hygiene Officer

Aboard Theodore Roosevelt, the Industrial Hygiene Officer (IHO) is not assigned to the medical department, but rather to the safety department. Theodore Roosevelt's IHO is LT Scott McClellan, MSC, who is Assistant Safety Officer. Navy Medicine recently spoke with LT McClellan about his duty aboard the carrier.

How did you become the IHO and Assistant Safety Officer on Theodore Roosevelt?

Actually, my career path has deviated from the norm. I was a Safety Officer on a tender first and then moved to the carrier, instead of vice versa. The tender was a pure industrial environment and very traditional work for an IHO. But recently, the fleet gave up compensation to get IHO's on aircraft carriers to be the Assistant Safety Officers. That's the background on how I arrived on *Theodore Roosevelt*.

What is an IHO's typical day?

I really don't have any one typical day since I'm involved in so many different activities on the ship. My department has a commander as Safety Officer and seven enlisted men and one Chief Petty Officer. As the Assistant Safety Officer, I'm involved in accident investigations. Each time a *Theodore Roosevelt* sailor is injured and reports to medical, an accident investigation is initiated. I'm also in charge of a repair locker during general quarters. I direct 75 men in a damage control party which does firefighting, patching, repair work, etc., in the case of an emergency or attack. My division is also respon-

sible for the Respiratory Protection Program on the ship which involves training and education as well as fit-testing for respirator wearers. As for other IHO duties, I am often involved in answering safety-related questions concerning hazardous materials. If there is a question concerning these substances, I have to figure out how it is being used, what is in that product, and what precautions/controls are necessary. In addition, I perform surveys on workspaces to assess the hazards that are present and the personal protective equipment and clothing required. It is important to take each situation individually. Each sailor tends to work differently and that must be taken into account. I conduct air sampling and send the samples to a lab for analysis if I do not have the capability myself. I compare the results to established NAVOSH standards for permissible exposures. Of course, I and other members in my division, conduct daily rounds of ship's work centers, keeping our eyes open for health, safety, and environmental hazards. Once we identify a hazard, we work with the divisional Leading Petty Officer and Safety Petty Officer to resolve the deficiency.

Is there an IHO on every carrier?

Yes, but not on all surface ships. Presently, CV/CVN, AS, AD, and AR type ships are the only ships with IHOs. IHOs were first used as shore-side support to Navy line working out of MTFs where there was a priority such as air rework facilities, shipyards, and large Public Works Centers. Now we have an evolving career path starting at the MTF or an Environmental and Preventive Medicine Unit then going operational (e.g., fleet

and FMF) followed by tours with increasing responsibility. My career started at an MTF supporting a shipyard then went to an AD and now to *Theodore Roosevelt*. This process has taught me how to be a naval officer first, then an IHO, and what the Navy is all about, the fleet.

I understand you just took a course in firefighting?

My personal belief is that I cannot be a good Safety Officer unless I know how other people do their jobs. That's why I took a course on firefighting. I need to learn about firefighting to assist me in conducting safety inspections. In the past, the Safety Officer billet has been a collateral duty position for a line officer. IHOs became a logical choice for this position as safety, health, and environmental requirements increased. IHOs already were trained and educated in these areas. My first two ship's commanding officers really pushed me to learn more than just industrial hygiene. They wanted me to learn more about the ships specifications, technical manuals, and how the ship works.

How much influence does the IHO have?

It depends on the attention given to environment, safety, and health by the CO. If he is interested in seeing these programs as a high priority then they really function. The commanding officer has multiple areas of concern, but, if he gives these his support, they can be outstanding. He knows I'm protecting the ship and its crew, so most of them are acutely interested in making sure I have enough backing to do the job I need to do.

What is your contact with the medical department?

My interaction is limited to dealing with the preventive medicine technicians (PMTs). The PMTs implement the occupational health medical surveillance programs such as hearing conservation, respiratory protection, asbestos, etc. They also administer audiograms, spirometry, occupational immunizations, lab tests, and other required screening exams.

What do you do differently than other medical department officers?

Well, because of my position in safety, I stand departmental watches like my medical counterparts. But, additionally, I also stand watch for the ship in port as the Assistant Command Duty Officer (ACDO). When the CO and XO are off the ship, the Command Duty Officer (CDO) is placed in charge. The ACDO is his assistant. This takes priority over your regular duties and can consume all your time. Under way, I also stand Officer of the Deck (OOD) where the OOD carries out the plan of the day, and is responsible for the safety and navigation of the ship. The rule is to stay alert, avoid all contacts (other ships), and navigate the ship.

It's a big responsibility. So every 6 days I stand either OOD or ACDO if in port. These additional watches, though time consuming, I feel integrate me into the crew and the ship like no other MSC and pays future dividends particularly if you can earn your Surface Warfare Officer Qualification.—JKH

However, this fan room may not be adequate to store all medical waste generated during a long deployment. Currently, *Theodore Roosevelt's* medical personnel are examining the possibility of offloading sterilized medical waste onto supply ships.

Hazardous Material Management

Moreover, the aircraft carrier is a highly industrialized workplace, requiring huge quantities of hazardous materials and chemicals to maintain its machinery, equipment, and aircraft. Many of these are hazardous in some way (e.g., flammable, corrosive, oxidizing, and toxic) and create the potential for acute or chronic injuries/illnesses. This huge inventory of hazardous materials bears a large price tag when it's time for disposal. To deal with the skyrocketing costs of disposal, the Navy needed a plan. Previously, there was no centralized control, ashore or afloat. However, *Theodore Roosevelt* is now in the forefront of developing a consolidated system of distributing and storing these materials. The new program is called the Hazardous Inventory Control System, or HICS.

Hazardous Inventory Control System (HICS)

HICS is a simple, yet resourceful, way to handle the storage, distribution, and collection of hazardous material (HAZMAT). The focus is on big-ticket high volume items such as paints, solvents, oils, and grease, although many other hazardous substances are included. This program has many fiscal, environmental, and safety benefits. In fact, it has revolutionized the way the ship approaches HAZMAT management.

Although *Theodore Roosevelt* was one of the first ships to adopt the system in November 1992, HICS was

originally developed by the Aircraft Intermediate Maintenance Department (AIMD) at Point Mugu, CA. Before HICS, each division or work center would order HAZMAT through Navy supply channels. Not only would this take considerable time, but the quantity delivered was often far in excess of the actual amount needed for the job. A consumer often would have to order an entire gallon of solvent even if only 4 ounces were needed because the unit of issue from the supply system dictated solvent by the gallon. Moreover, once the job was finished the excess substance was stored in workspaces. Although sometimes used again, more often the excess substance was simply discarded. This was wasteful and meant that HAZMAT was stored all over the ship creating a safety, health, and disposal problem. Unfortunately, the problem was often solved by throwing the excess over the side which until recently was legal.

The HICS program solves all this with a centralized system of storage and issue of all HAZMAT. The HICS facility is essentially a store from which all HAZMAT on the ship is inventoried and distributed. However, at this store the container and any excess must be returned. This eliminates the need for individual divisions and work centers to worry about storage and disposal. The key is a computer program which tracks each container of HAZMAT.

The HICS office is open 24 hours a day to mirror the ships operational tempo (optempo). The customer merely requests the item and amount needed for that particular job. The HICS personnel locate the item on computer and allocate a container of the substance to the customer. The computer records the substance and amount dispensed.

The customer has 48 hours to re-

turn the container and any excess material back to HICS. HICS then reissues the used portion or disposes of it and the container in the excess HAZMAT storage system. The HICS office is always very busy, distributing and collecting some 400-500 products daily.

The fiscal benefits are sizable. Primarily, HICS minimizes the total amount of HAZMAT *Theodore Roosevelt* purchases, stores, and disposes. The HICS office buys the substances in bulk quantities. However, it distributes the products in small quantities tailored to the amount needed for an individual job. This reduces the quantity of waste tremendously. Moreover, any excess material is returned and can often be reissued. Finally, productivity also increases because each division or work center must do considerably less paperwork to receive HAZMAT; only a request chit is needed, HICS does the rest.

The HICS system has been a boon to *Theodore Roosevelt's* environment and the environment at large. This was due to two critical steps—first, requiring the return of containers and excess HAZMAT and second, a HAZMAT trailer to consolidate the paints, oils, and solvents. The requirement to return all HAZMAT within 48 hours ensures that crewmembers will not take disposal measures into their own hands. The HICS office is also in charge of HAZMAT disposal. Doling out just enough for each job means there will be little excess HAZMAT to be returned. Whatever HAZMAT or containers that cannot be reused are then sent to the HAZMAT trailer, which is an

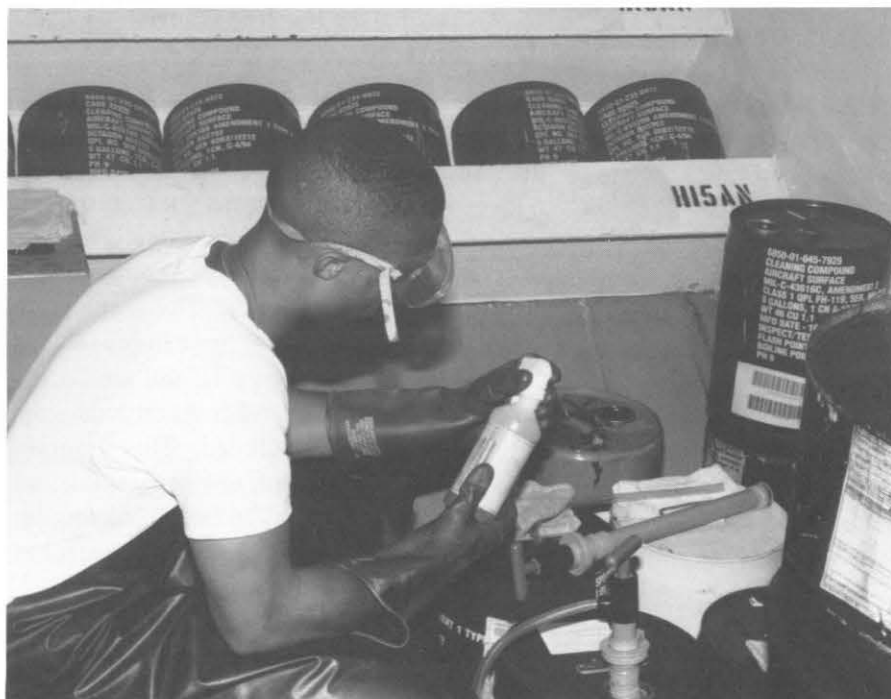
environmentally controlled storage unit with fire suppression system, supply and exhaust ventilation, and other control measures to prevent any problems. The HICS trailer is conveniently placed on the hangar bay. Inside are standard 55-gallon drums to hold the most common liquid excess HAZMAT such as paint, oil, and fuel. The trailer also houses a drum designed to drain aerosol cans so they can be safely crushed. Unfortunately, the trailer is not big enough to store the excess HAZMAT from an entire deployment so when it fills up, *Theodore Roosevelt* must transfer some of the material to a supply ship at sea.

The final HICS benefit—safety—is most relevant for Navy medicine. Keeping HAZMAT storage out of the workspaces reduces the fire, safety, and health problems on an enclosed ship, and is prevention at its best. The way the Navy handles its refuse is rapidly evolving. It has responded to America's rising concern with environmental pollution and degradation

by changing the way it does business at sea. No longer can garbage and excess materials be merely weighted and "deep sixed" at the end of the day. However, it is not without problems trying to solve this large logistics problem. Aircraft carriers during deployment daily generate 3,400 lbs of metal/glass (galley), 7,000 lbs paper/cardboard, and 1,300 lbs of plastics. Food-contaminated plastics are prohibited from being discharged during the last 3 days before entering port while non-food contaminated plastics are held on board during the last 20 days before entering port. This is called the 3/20 day rule. Installation of plastic waste processors will help ease this problem as they will enable ships to compact, sanitize, and store all plastics on board for later disposal ashore.

Industrial Hygiene

Industrial hygiene is an important health and safety issue aboard *Theodore Roosevelt*. The Industrial Hygiene Officer (IHO) is the Assistant Safety Officer and Division Of-



FA Jeffrey Linzy fills a request for a HAZMAT by dispensing a cleaning solvent from a bulk container into a small spray bottle.

ficer of the safety department. The IHO is a Medical Service Corps (MSC) officer. Industrial hygiene is the second largest subspecialty within the MSC Health Care Sciences (HCS) with 140 officers. This community has a heavy operational emphasis with 40 percent attached to line commands (e.g., fleet and type commanders, INSURV, FMF) and 31 shipboard billets as Division Officer or Department Head on CV/CVN and AD/AS/AR type ships.

Their history dates back to World War II and the Naval Shipyards where the incredible building tempo was resulting in a high level of injuries and illnesses among shipyard personnel. Navy medicine first attempted to address the problem by sending physicians to a 3-month industrial hygiene short course at Harvard or Columbia. They soon realized they needed more trained officers with graduate training specific to industrial hygiene. Today, Navy IHOs establish and direct occupational health and preventive medicine programs at Navy medical treatment facilities as well as occupational health, safety (NAVOSH), and environment programs aboard ship and at major headquarters staffs.

Their field work involves the anticipation, recognition, evaluation, and control of work-site hazards. This is carried out by conducting surveys whose purpose is to control chemical, physical, and biological agents which may cause adverse health effects. These include, but are not limited to,

indoor air quality, hazardous materials, hearing conservation and noise abatement, heat stress, sight conservation, radiation, ergonomics, personal protective clothing and equipment, toxicology, and ventilation.

Aboard *Theodore Roosevelt*, the safety and medical departments are both responsible for reducing the health threat to crewmembers from workplace hazards. Industrial hygiene work began even before *Theodore Roosevelt* took its first operational cruise. After the ship was built and before the IHO reported aboard, IHOs and civilian industrial hygienists from NMC Portsmouth, conducted a shipwide inspection that became the baseline survey. They surveyed every workplace to evaluate hazards and quantify exposures (e.g., noise, heat, toxic chemicals, etc.). These exposures were compared to Navy Occupational Health and Safety (NAVOSH) standards for permissible exposure limits and appropriate safety/health precautions were recommended. Every 18 months, or when a modification occurs (e.g., yard period), the IHO must reinspect the workspaces to evaluate the current hazards.

The ship medical department's primary NAVOSH contribution is implementing the medical surveillance program for crewmembers whose work processes are identified as hazardous by the IHO. For example, medical may track 1,500 people on the Respiratory Protection Program or conduct 2,000 hearing tests each year. The

medical department tracks which personnel are exposed to what and conducts hazard specific periodic medical surveillance examinations based on the IH survey.

Safety and medical's work is complicated by the unique work situation aboard a Navy ship. In private industry a civilian works 40 hours a week, generally doing the same job, such as welding. In the Navy, one day a sailor may weld only infrequently or on different work rotations within the 24 hour period. Other days, he may weld continuously due to optempo, so determining individual exposures can be difficult. The IHO makes the determination whether the welder needs medical surveillance. However, this same crewmember may have many other tasks to perform, he may be exposed to many other hazards and therefore must be tested for these as well.

What is happening aboard *Theodore Roosevelt* illustrates that environmental awareness has not only reached the fleet but that steps are under way to ensure that the Navy is committed to safeguarding not only the safety and health of its shipboard sailors but also the health of the skies and oceans in which it operates. □

Mr. Klubes is historical/editorial consultant to the Command Historian, BUMED, Washington, DC.

Recollections of NAMRU-2: 1944-1946

CAPT Rollin H. Baker, MSC, USNR (Ret.)

The American armed forces, although victorious in the early action in the Southwest Pacific, were besieged by an array of crippling medical problems in that tropical environment. Servicemen, responding poorly to the hot, humid climate, contracted numerous ailments for which they had little natural resistance. Especially troublesome were skin rash, malaria, scrub typhus (tsutsugamushi), Japanese B encephalitis, infectious hepatitis, melioidosis, hematuria, filariasis, dengue, etc. The Japanese apparently had similar difficulties. As a result, U.S. Naval Medical Research Unit No. 2 (NAMRU-2) came into being in 1944 as a major effort to help prevent and alleviate such medical hazards and keep our forces fit for carrying out their missions in the Pacific War Theater.

Preparations for Pacific Duty

Before mid-1944, NAMRU-2's Commanding Officer CAPT Thomas M. Rivers, MC, USNR, assembled an array of biomedical expertise to include every conceivable aspect of laboratory and field epidemiology. Specialists, either already on active duty or in civilian life, were recruited to engage in research-oriented work

in pathology, bacteriology, chemistry, viral and rickettsial diseases, malariology, entomology (vectors such as mosquitoes and flies), internal parasitology (organisms causing hookworm disease, filariasis, schistosomiasis, helminthiasis), external parasitology (such vectors as mites, ticks, lice, and fleas), mammalogy and ornithology (potential disease-carrying vertebrates), dermatology, live animal care (maintenance of laboratory rabbits, rodents, insects), and medical statistics. In addition, BUMED provided necessary and rapid backup library resources.(1)

In fact, when NAMRU-2 finally became fully operational at its field

headquarters on Guam in early 1945, CAPT Rivers informed his officers at the first monthly scientific seminar that the Unit had the finest personnel and equipment of any medical research facility west of New York City.

The NAMRU-2 headquarters was first established at the Rockefeller Institute for Medical Research (now a part of Rockefeller University) where CAPT Rivers had been a staff member. Nobel Laureate Dr. Herbert Gasser, director of this celebrated Institute, long known for its cadre of famed "microbe hunters," welcomed the NAMRU-2 scientists granting them staff privileges and providing them with research facilities.

I was assigned to an office at the International Health Division (IHD) of the cooperating Rockefeller Foundation, where I conducted insect studies.(2) To gain knowledge about vertebrates of medical importance to Pacific-based members of the armed forces, I studied research collections of birds and mammals previously collected from the region and then preserved in museums in Cambridge, Washington, and New York. I also interviewed persons or examined the diaries of personnel who had previously conducted biological surveys in such areas as Micronesia.

I also purchased specialized equipment and supplies, including guns,



CAPT Thomas M. Rivers

ammunition, and animal traps, in order to field a fully-equipped collecting team of vertebrate biologists. To expedite purchases, The Rockefeller Foundation generously provided NAMRU-2 with \$25,000 in cash to buy items outright without going through time-consuming naval purchasing routines. I truly enjoyed shopping at Abercrombie & Fitch and other expedition outfitters in the New York area.

My gear, plus equipment and supplies obtained for other NAMRU-2 laboratories, and everything else required to completely outfit the Unit were ultimately transported to the West Coast. It was then loaded on a ship to be convoyed to Guam well in advance of the arrival of the personnel. The entire NAMRU-2 physical package—unassembled housing and laboratories, interior furnishings, research equipment, commissary, laundry, barber shop, plumbing and electrical necessities, automotive equipment including jeeps, even recreational supplies, etc.—completely filled the hold of one large freighter. This total effort, completed in record time, was indeed a major feat in naval logistics.

Pacific Duty

Travel orders dated 25 Oct 1944 brought NAMRU-2 personnel together at the Naval Advance Base Personnel Depot, San Bruno, CA, for brief training in physical fitness and ordnance for “duty outside the continental limits of the United States.” By late November we boarded the troopship *SS Cape Cleare* (a former Matson liner) to join a slow-moving convoy and headed west. Following stops at Pearl Harbor and Eniwetok, we reached Guam in early January 1945.

Guam

NAMRU-2 personnel—including 39 officers with designations as scientists, 9 as administrators, and more than 250 rated (mostly pharmacist’s mates) and nonrated seamen—were first housed in jungle-shrouded tents. CAPT Rivers appointed me, an ex-line officer, as gunnery/security officer during the construction of NAMRU-2 headquarters. I arranged the scheduling of compound guards who sometimes fired into the jungle undergrowth on hearing strange sounds. Fortunately, we found none of the enemy still lingering in the

Guamanian bush prowling around the facilities.

This duty, however, did not prevent me from joining other officers and enlisted men in helping the Seabees construct our buildings. I served on a team that bolted together heavy metal panels. While doing so, we occasionally muttered vile remarks about building designer Butler and his henchmen in Kansas City for inventing such hard-to-erect buildings. Other NAMRU-2 personnel, including biomedical scientists, gained training in such skills as running power equipment, finishing cement, hanging doors and windows, stringing electrical wiring, plumbing, painting, etc.

Air raid alerts in those early months on Guam were few. Japanese fleet and land forces were in the process of being shoved back toward their home islands. The war seemed real enough, however, when returning aircraft made daily approaches over our headquarters to the air field after bombing enemy targets. Sometimes they displayed wing damage from enemy fire.

NAMRU-2 Operational

By mid-February, NAMRU-2 officers and crew moved into their newly completed facility and began work in earnest at their research laboratories. NAMRU-2’s mission as described earlier, was to determine ways to prevent our troops from contracting and spreading crippling diseases to which they had little or no natural resistance. In short, NAMRU-2 was charged with finding ways to deter troop ailments ranging from diarrhea and prickly heat to malaria, schistosomiasis, and hook worm in-



Left to right: Charles O. Davison, Odis A. Muennink, and author Rollin Baker in front of their faithful jeep on Guam, June 1945.



festations. If, for example, a large sector of an invasion force suddenly acquired vector-borne diarrhea on D-day, the enemy might very well be the victor.

The Bird and Mammal Laboratory

LTDavid H. Johnson, H(S), USNR, on leave from his curatorial position at the Smithsonian Institution (National Museum of Natural History) joined me in directing the Bird and Mammal Laboratory. Pharmacist's mates specially selected as assistants were Charles O. Davison, L.P. McElroy, Merle Markley, Odis Muennink, and Walter Necker. Our staff worked closely on reservoir-vector-disease problems with the Parasitology, Virology, and Bacteriology Laboratories.

We immediately began a systematic survey of introduced rodents, native fruit bats, and resident and migratory birds and their potential as reservoirs of medically important diseases and parasites on Guam and other strategic Pacific islands. After voucher specimens of birds and mammals were collected, identified, and examined biomedically, they were preserved as museum specimens and ultimately deposited in the Smithsonian Institution.

Our accumulation of specimens of exotic-looking parrots, colorful song birds, large fruit bats, and other interesting creatures of the Pacific attracted considerable attention. Because of its unique medical mission NAMRU-2 was a major stop for touring dignitaries. CAPT Rivers almost always brought these congressional parties, cabinet members, USO celebrities, high-ranking service people, etc., to view the attractive specimens. It also gave our staff abundant opportunity to explain why ornithologists/mammalogists were important to the war effort. A photograph of CINCPAC Fleet ADM Chester Nimitz admiring a tray of bird skins hung prominently on one wall of the laboratory.

Populations of Guam's noxious Polynesian rats (*Rattus exulans*) and black rats (*Rattus rattus*) were specimens of particular interest for our studies. They were trapped alive in specially constructed cage traps set in a grid, identified, examined biomedically, tagged, released, and subsequently retrapped in order for us to learn about their habits, densities, movements, home ranges, seasonal parasite loads, etc.(3) The data proved helpful to military units striving for rodent-free compounds. Also monitored for parasites and possible viral/bacterial infections were migratory



shore birds (sandpipers and plovers). Of most concern were those which nested in northern parts of eastern Asia and wintered on troop-based Pacific islands.

Due to my previous experience as a wildlife biologist, I was asked to assist in the introduction of ring-necked pheasants to Guam. It seemed that ADM Nimitz wanted to hunt pheasants in his "spare" time. From an ecological standpoint, I disap-



*Top left: NAMRU-2 Headquarters on Guam. Left: Dr. Baker (kneeling next to U.S.N. pack) and his colleagues investigate habitat on Falalop, Ulithi Atoll, 18 Aug 1945. The photo was taken by a *Time Magazine* photographer but never used in his story.*

proved of the introduction of this exotic, but lacked sufficient rank to protest. Happily for the local ecology, these game birds, flown in by the CINCPAC's personal pilot from a game farm on the Pacific Coast, disappeared almost immediately after being released.

Vertebrate/parasite surveys were also conducted in the Solomons, on Ulithi whose lagoon was a major fleet anchorage in the Western Carolines,

the Palaus, Iwo Jima, Rota, Okinawa, and shortly after the cessation of hostilities on Truk.(4)

The Birds and Mammal Laboratory also gathered data about potential disease-carrying rodents in coastal China, since there was one directive indicating that the Allied forces might invade China and attack Japan from its west flank. However, this need was eliminated when atomic bombs ended the war.

Research Under Combat

Perhaps the most glamorous NAMRU-2 activity was its participation in two phases of the Okinawan invasion. The first was preinvasion spraying of large quantities of insecticides, especially in the vicinity of proposed landing beaches. No spray planes were lost to enemy fire because Japanese anti-aircraft batteries had great difficulty tracking the low-flying aircraft. However, entomolo-

gist Dr. John Maple (LT, H(S), USNR) was killed when his spray-plane crashed—the only NAMRU-2 war casualty.

For the second phase famed virologist CDR Richard E. Shope, MC, USNR, led a NAMRU-2 research team that landed on an Okinawan beach with the invasion forces on D-Day+6. Shope's team conducted studies on urgent troop-related medical problems. Autopsies under field combat conditions were even undertaken on casualties suspected of having Japanese B encephalitis.

Other NAMRU-2 Studies

When servicemen contracted schistosomiasis while wading or bathing in streams on Leyte, NAMRU-2 specialists surveyed the situation and suggested preventive actions. Famed dermatologist CDR Marion B. Sulzberger, MC, USNR, investigated the troubling problem of heat rash and other skin ailments of island-based servicemen. Pathologist LCDR Harry M. Zimmerman, MC, USNR, studied the ecology of native Guamanians who died of hookworm disease and recommended practical changes in human life-style to the local authorities in order to reduce local infections of young children. Even more dramatic was his finding of a high incidence among Guamanians of amyotrophic lateral sclerosis (ALS or Lou Gehrig's disease). This wartime diagnosis has led to a continuing study of this unique medical problem.(5)

Other medical matters addressed in both military and civilian patients were conjunctivitis and trachoma,(6) infectious hepatitis, acute yellow atrophy, malnutrition, and wound repair. NAMRU-2 personnel demonstrated that the administration of synthetic amino acids is a practical and valuable form of protein substitution therapy.(7) Finally, NAMRU-2

specialists were called to the Wakayama anchorage in Japan to determine that picric acid seeping from jettisoned Japanese munitions into drinking water was the cause for a high incidence of urinary complaints (hematuria) among naval personnel.(8)

Field and laboratory experiences obtained by enlisted personnel encouraged many of them to select biomedical careers in the post-World War II years, either continuing or beginning academic training in medicine or allied fields. At least nine were awarded the degrees of M.D. or Ph.D.

Reflections

Years later, an environmental tragedy, in part attributable to the war and the military, really affected me. In 1985 I revisited Guam and examined the biota which I had studied during 11 months of Pacific duty in 1945. I looked in vain for the array of attractive endemic birds, which had delighted me and my associates. Gone were the white-throated ground-dove, Mariana fruit-dove, Vanikora swiftlet, Micronesian kingfisher, Nightingale reed-warbler, rufous fantail, Guam flycatcher, bridled white-eye, and cardinal honeyeater.(9). Somehow, perhaps as a passive stowaway in cargo, the brown tree snake (*Boiga irregularis*), a native of the Southeast Asian region, became acclimated on Guam, probably before 1960. The local bird life on this almost enemy-free island was no match for this agile predator.(10)

If the United States is ever involved in another major conflict, global or otherwise, we who helped make the NAMRU-2 mission a success hope similar biomedical field units will be established and dispatched to the theaters of conflict at the start of the campaign. Had NAMRU-2 been operating earlier in the Southwest Pa-

cific, I am convinced that many of the disabling environmental medical problems might have been alleviated.

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Technical and editorial assistance is acknowledged from physicians Dr. Andrew Jack Barger and Dr. William H. Becker, both pharmacist's mates at the time of their service in NAMRU-2 and who later received their medical degrees. See also *Collier's*, Nov 10, 1945, and *Tom Rivers: Reflections on a Life in Medicine and Science: An Oral Memoir*. Prepared by Benison S. Cambridge, MA: MIT Press; 1967: chap 8. □

Dr. Baker, a vertebrate zoologist in civilian life, served as a line officer with the Atlantic Fleet prior to being reclassified as LTJG H(S), USNR and ordered to join NAMRU-2 as mammalogist and ornithologist in June 1944.

Naval Medical Research and Development Command Highlights

●Study of Biomechanical Factors of Overuse Injury During NAVSPECWAR Training

NAVSPECWAR (Naval Special Warfare) personnel are subject to physically demanding tasks during military training, exercises, and operations which result in a high incidence of overuse injuries. These cause unnecessary morbidity, protracted recovery periods, and decreased readiness. Researchers at the Naval Health Research Center, San Diego, CA, are currently studying the biomechanical factors (i.e., ground reaction force patterns, quantification of shock wave transmission, foot pressure distribution, and bilateral motion analysis) related to the development of overuse injuries. Study results will be used to develop a model to predict specific overuse injuries. Also, the information will be used to develop screening programs, and prevention and rehabilitation strategies that will be implemented by medical care providers, the Military Entrance Processing Command, and the training commands. The study was requested by the offices of the Commander, Naval Special Warfare Command; the Chief, Bureau of Personnel; and the Chief, Bureau of Medicine and Surgery.

●Entomological and Rift Valley Fever Surveillance Support to Operation Bright Star '94

Operation Bright Star is a biennial joint military exercise in Egypt involving U.S. and Egyptian forces. Troops perform maneuvers and cross-training exercises at remote sites under field and simulated combat conditions. As a result, troops are at increased risk of exposure to biting arthropods and arthropod-borne diseases (i.e., Rift Valley fever, West Nile fever, malaria, leishmaniasis, and filariasis), as well as encounters with snakes, scorpions, and spiders. The U.S. Naval Medical Research Unit No. 3 (NAMRU-3) in Cairo, Egypt, historically assists in disease and vector surveillance support and as a reference resource to Bright Star operations. During the 1994 exercise NAMRU-3 field teams collected nearly 1,000 mosquitoes during 126 trap-nights. *Culex pipiens* was the most prevalent species collected, accounting for more than 87 percent while *Culex perexiguus* and *Aedes*

caspius, accounted for 3.6 percent and 7.9 percent respectively. Two potential malaria vectors, *Anopheles pharoensis* and *Anopheles multicolor*, accounted for 0.3 percent and 0.7 percent respectively. Additionally, 490 U.S. troops were enrolled in an oral diagnostic protocol to assess their exposure to Rift Valley fever. Neither the virological screening of collected mosquitoes, nor salivary screening efforts resulted in detection of Rift Valley fever virus. Professional and technical support provided by NAMRU-3 during Bright Star '94 is yet another indicator of how extremely valuable military overseas research laboratories are in supporting deployed troops.

●MEDTAG Moves Forward in Development

Field corpsmen must document patient status and treatment at forward echelons of care to maintain continuity of care during combat and to facilitate follow-on care when the patient is evacuated. Field testing of MEDTAG, a prototype electronic battlefield medical data collection device, demonstrated its operational effectiveness during exercises at Fleet Marine Force Training, Field Medical Services School, Camp Pendleton, CA. Now, MEDTAG is being enhanced to interface with the Multi-Technology Automated Reader Card (MARC) being evaluated by OSD(A) for the Theater Medical Information System (TMIS). Using recent advances in electronic data storage technology, researchers at the Naval Health Research Center, San Diego, CA, are evaluating and planning for several additional enhancements. These include the feasibility of providing expert decision support for personnel at the first and second echelons of care, automating the capture of physiologic information using voice-activated data entry, increasing the efficiency of the machine-user interface, and assessing equipment reliability.

For more information on these and other research efforts by NMRDC, contact CAPT T.J. Singer, MSC, Director, External Relations, at DSN 295-6182, Commercial 301-295-6182, FAX 301-295-4033, or E-Mail RDC03@NMRDC1.NMRDC.NNMC,NAVY.MIL.



Navy Medicine

November-December 1944

Joseph Frechette

During the closing months of 1944 the Allies continued to tighten their grip on the Axis. The war in the Atlantic was relatively quiet until the end of December when the newer U-boats equipped with snorkels mounted a few raids but none on the scale seen at the height of the Battle for the Atlantic.(1)

In Europe, British and American forces continued to advance on Germany and were only delayed by the last ditch offensive Hitler opened in the Ardennes on 16 Dec. The attack, later called the Battle of the Bulge, was unsuccessful and cost the German men and equipment badly needed on the Eastern Front to slow the Russian advance.(2)

In the Pacific, the Japanese navy was still reeling from the devastating losses it had suffered in the recent Battle of Leyte Gulf. Meanwhile, the Leyte offensive continued until 10 Dec after an additional landing on 7 Dec at Ormoc Bay. On 15 Dec Mindoro was occupied in preparation for the liberation of Luzon. In addition, plans were well under way for the coming invasion of Iwo Jima.

Operations at Leyte

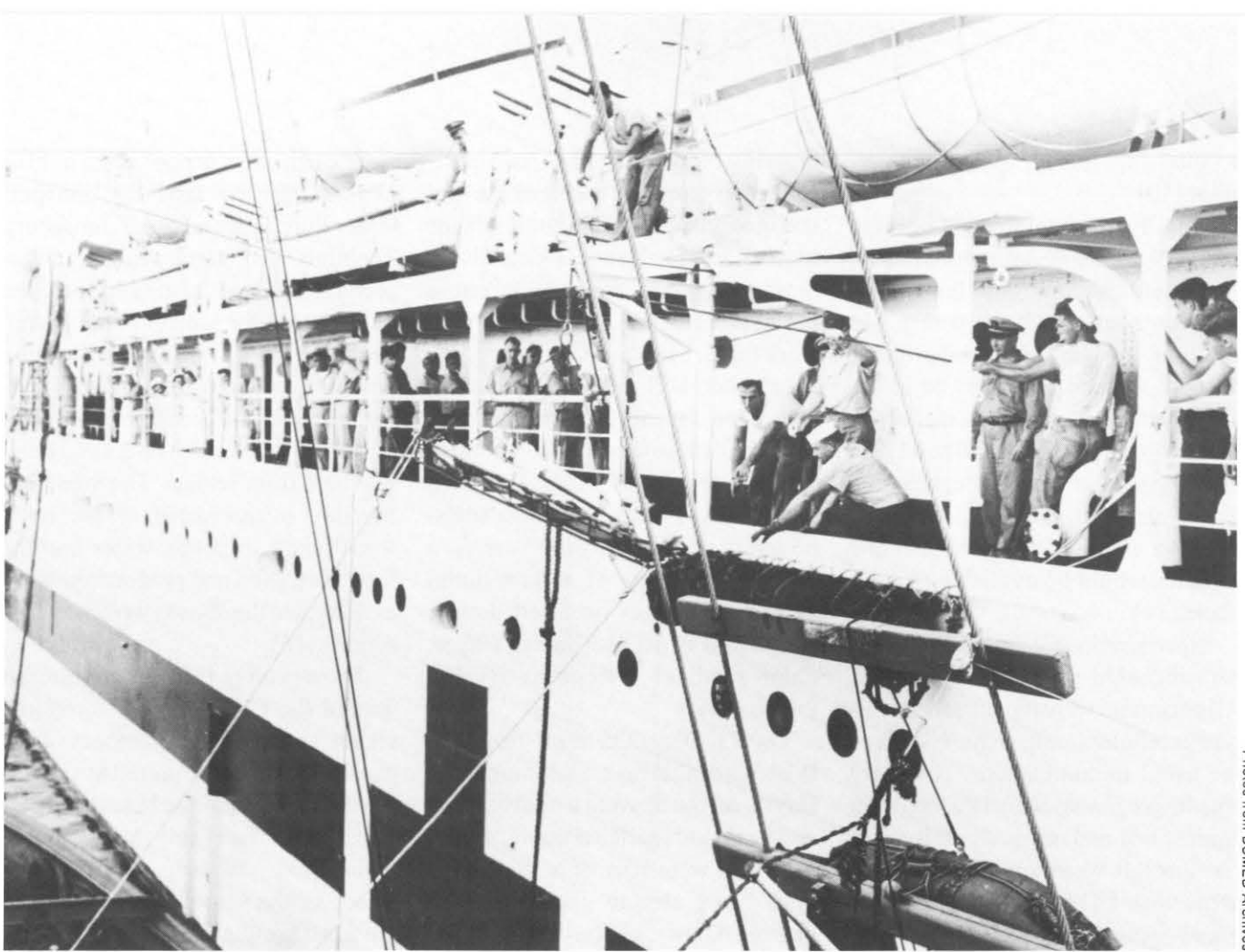
During the fighting on Leyte, Navy medical care was confined to the care of the wounded on the beaches and general evacuation. While on the island, Army units had their own medical personnel and supplies.(3)

The Navy Medical Department also participated in providing civilian care on Leyte wherever possible. Filipinos came to the aid stations in large numbers and were treated for chronic ailments such as coughs, tropical ulcers, gastrointestinal disturbances, and cholera of infancy as well as injuries resulting from combat. Several pregnancies were also reported. One case was sent to an APA for delivery; the chaplain christened the baby with the ship's name. Planners later decided that in the future separate civilian medical facilities should be established early in a campaign. However, the care given on Leyte was generally a considerable improvement over the previous Pacific campaigns.(4)

Throughout the campaign for Leyte kamikaze raids continued to plague the ships of the U.S. fleet, and the

medical personnel of the fleet had to meet the challenge of this serious threat. During the Ormoc Bay landings on 7 Dec four separate attacks missed USS *Ticonderoga* (CV-14) while USS *Maryland* (BB-46) was not so lucky. A plane carrying a 500-pound bomb struck the port side of turret one and penetrated down to the armored second deck wounding all in the area as well as destroying the sick bay. However, such an occurrence had been anticipated and, as a precaution, medical supplies had been distributed throughout the ship. In addition, the junior officers and warrant officers' wardrooms were converted into a new sick bay. The more seriously injured cases were transferred via LST-171 to a hospital ship 15 hours after the crash.(5)

The evacuation of personnel from stricken ships by LSTs became common during the fleet actions around Leyte. USS *Mahan* (DD-364) was damaged and scuttled during the Ormoc Bay landings and her casualties taken to USS *Mercy* (AH-8) by LST-464. The casualties of USS *Hughes* (DD-410), hit 10 Dec, were



Photos from BUMED Archives

Patients are brought aboard hospital ship USS *Samaritan*.

first transferred to USS *Laffey* (DD-724) and the next day to a hospital ship by LST.(6)

Preparation for Iwo Jima

Plans for the February invasion of Iwo Jima had begun as early as October and continued apace. The United States wanted to establish a base on Iwo Jima for fighter planes to escort the B-29 superfortresses operating from the Marianas on their bombing missions over Japan. Iwo Jima would also provide a way station for returning bombers crippled or low on fuel.(7)

The island's terrain was thought to prohibit tactical surprise, limiting the Marines to a frontal assault. Aerial reconnaissance and other intelligence showed the island heavily defended by an entrenched garrison. Therefore, planners expected a 20 percent

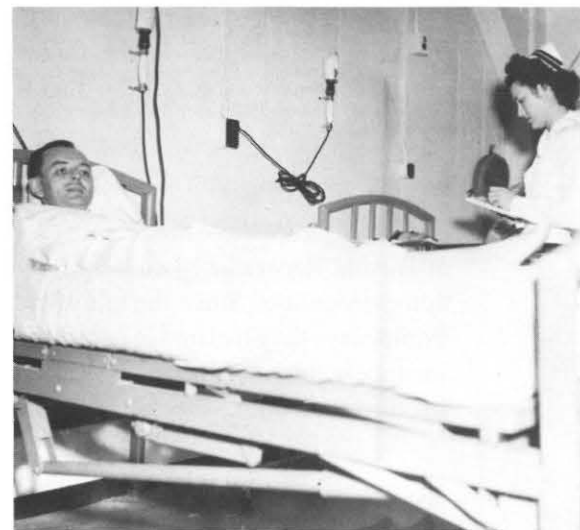
casualty rate as well as a number of enemy and civilian casualties.

Medical representatives from the Navy, Marine Corps, and participating amphibious units met to discuss tactical and logistical problems in dealing with the expected heavy casualties.(8)

Navy medical personnel formulated evacuation, hospitalization, and supply policies and plans. Each medical company and corps battalion would carry the necessary equipment to construct a 144-bed hospital. Approximately 3,600 beds would thus be available ashore, twice the number of the Marianas campaign. The Eighth Field Depot also planned to stock enough cots, tents, blankets, and mess gear to support another 1,500 bed facility.(9)

For evacuation purposes, at least one special, medically equipped and

staffed LST(H) would be present at each of the four invasion beaches. The medical personnel aboard the LST(H)s would conduct preliminary examinations of the casualties and then transfer them to transports and



Samaritan's sick officers' quarters

hospital ships for more definitive treatment.(10)

Initially, the complement of these LST(H)s was to be 4 surgeons and 27 corpsmen, although it was later raised to 5 surgeons and 35 corpsmen. In addition, two hospital ships and a hospital transport were to be in the vicinity to evacuate patients to Saipan and Guam which had 1,500 and 3,500 beds respectively. Air evacuation would also be used when it became feasible, and medical personnel and supplies would be available on each plane.(11)

In preparation for the landing, planners included preventive measures. All personnel were inoculated against typhus, cholera, and plague and given the usual immunizations. Clothing was impregnated with DDT powder against lice and mites. Initially, carrier aircraft were to spray occupied areas with DDT. Later, land-based planes would do the job.(12)

The medical supply plan included an allowance of medical supplies for 30 days as well as plans for emergency resupply by air if necessary. Moreover, with the establishment of the Whole Blood Distribution Center #1 on Guam it was possible to have a blood center available for the first time at the target area. LST(H)-929 was designated to carry the blood bank for distribution to the forces during the early stages of the operation.(13)

POWs of Bilibid

The plight of the American POWs at Bilibid Prison in Manila had become desperate. Since the fall of the Philippines they had had to cope with inconceivable hardships stemming from malnutrition, disease, and the

brutality of their captors. As American forces closed in, the Japanese sent drafts of prisoners to the home islands to work as forced labor. Demands for more troops had depleted Japanese mines and factories of their civilian work force. Moreover, because of the devastation U.S. submarines had inflicted on Japanese merchant shipping, the detail of separate ships solely for the transport of POWs had been suspended. POWs were now transported in unmarked cargo vessels, a blatant violation of international agreements. This occurred despite the protest of CDR Thomas Hayes, chief medical officer of Bilibid Prison.(14)

On 13 Dec, 225 men from the Bilibid hospital unit, including CDR Hayes, set out on what would become an almost unparalleled atrocity. The prisoners were part of a 1,619-man draft being sent to Japan on what became known as the "hell ships." Nearly all Navy medical personnel of Bilibid were part of this draft but for one physician, one pharmacist, and six hospital corpsmen.(15)

The prisoners occupied the hold of *Oryoku Maru*, a Japanese transport under the command of LT Junsaburo Toshimo who, along with his interpreter, Shusuke Wada, had developed a reputation for sadism at the Davao penal colony. Commanding the guards was Kazutane Aihara, nicknamed "Air Raid" because of his habit of sneaking up on prisoners and beating them from behind. The men were horribly overcrowded in the hold. Insufficient food and water and the lack of oxygen and proper sanitation exacerbated the already wretched conditions.(16)

The next day U.S. carrier aircraft strafed the *Oryoku Maru's* convoy. Hayes and the other members of the medical staff were ordered to care for the wounded Japanese but denied permission to care for the wounded Americans. With its steering gear wrecked, the vessel ran aground 300 yards off the Olongapo Naval Station. On 15 Dec the prisoners were ordered to swim for shore. While they were being offloaded, U.S. flyers, unaware the men were POWs, again strafed



Malnourished American POWs languish in the hospital ward of Manila's infamous Bilibid Prison.

the ship. The approximately 1,350 prisoners who survived took refuge on a tennis court where they were held in the open.(17)

There they were granted a few spoonfuls of raw rice; their only water was a single small faucet. Sanitation was wholly insufficient. Many of the men had dysentery and were forced to wallow in their own filth.

With nothing in the way of medical equipment or supplies, the wounded could be given only the most rudimentary of care. Doctors and corpsmen performed surgery such as the amputation of a marine's arm, with knives and razor blades.(18)

During the 20th and 21st of December their captors housed the men in a jail and an abandoned movie house in San Fernando Pampunga. On Christmas Eve they were transported by rail to San Fernando Del Union. The wounded were forced to ride atop the train cars to discourage air attack.(19)

On the 27th sadistic Japanese guards loaded surviving POWs on two ships, *Brazil Maru* and *Enoura Maru* to continue the delayed journey to Japan. Food and water were still issued in inhumanely small quantities. Moreover, as the ships traveled north, the men began to suffer the effects of the colder weather; they were still clad in the light clothing they'd worn in the Philippines. PhM2c C.J. Peart recorded the dismal conditions aboard the *Brazil Maru* in his diary entry for 29 Dec:

"Still underway and obviously going due north, judging from the cold which is increasing. Intermittent naps during the day, otherwise chatting—yes, about chow. Practically no food at all today, and a very limited amount of water. The rice we get, if and when we get it, usually consists of the leftovers from our Taiwanese guards' rations, and since we've only got about six Taiwan guards it doesn't go very far among over 300 plus."(20)

The ships put in at Takao, Formosa, on 31 Dec for what would be a fateful

12-day break in the voyage. They were the only ships out of a convoy of six to escape destruction at the hands of U.S. subs that prowled these waters. However, the men's ordeal was far from over. Of the 1,619 that began the journey only 165 would survive the war.

Airborne Shipment of Whole Blood

On 16 Nov aerial shipment of whole blood to the Pacific began. The first load consisted of 160 pints and shipments followed daily.(21) The transport of what was to be an average of 1,000 pints daily was made possible by a refrigerated container developed by the Naval Medical Research Institute. This prevented the decomposition of the blood in the air due to high temperatures and rough movement.(22)

Hospital Ships

The hospital ships *USS Solace* (AH-5) and *USS Samaritan* (AH-10) were stationed at Ulithi Atoll during this time serving as base hospitals receiving casualties from the fast carrier groups.(23)

They were later joined by *USS Bountiful* (AH-9) which had been transporting wounded from Leyte to Hollandia, Manus, and New Guinea.(24) On 1 Nov *USS Refuge* (AH-11) set sail from New York for duty with the Seventh Fleet. She arrived at San Pedro Bay, Leyte, 24 Dec becoming the only hospital ship in the war to rate campaign ribbons from all three theaters of war, having previously served in both the Atlantic and Mediterranean.(25)

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Naval Aeromedical Problems Course

The annual Naval Aeromedical Problems Course will be sponsored by the Naval Aerospace and Operational Medical Institute, Pensacola, FL, 6-9 Dec 1994. The theme "Women in Combat" will be emphasized and current aeromedical issues and professional updates will be addressed. For information on registration or content, contact the Academics Department of the Naval Aerospace and Operational Medical Institute 904-452-2741/2458/8365.

Local points of contact are CDR G. Cox, MC, or CDR R. Matthews, MSC. They can be reached at 904-452-2458.

AFIP Hosts Short Courses

The Armed Forces Institute of Pathology (AFIP) and the American Registry of Pathology will be hosting four short courses during January and February 1995. The courses and dates are as follows:

Telepathology '95 will be presented 4-11 Jan 1995 at Disney World's Contemporary Hotel & Resort and the Grand Floridian Hotel, Lake Buena Vista, FL. This course is designed for health care professionals, scientists, and decision makers who wish to discern the facts and exchange information about the emerging field of telemedicine. Lectures will be given the first 3 1/2 days, followed by 3 days of poster presentations and interactive panel discussions. A tour of the NASA facility at Cape Canaveral is included. Tuition ranges from \$575 to \$975.

Oral Pathology will be presented 9-13 Jan 1995 at Disney's Contemporary Resort Hotel, Lake Buena Vista, FL. This course is designed to provide dentists and dental specialists with a fundamental knowledge of various aspects of oral diseases, with a focus on the clinical and radiographic aspects of oral disease. General pathologists, general pathology residents, and other physicians with an interest in diseases of the head and neck area would also find the course beneficial in bringing them up to date on recent developments in the field. Tuition ranges from \$175 to \$495.

Neuropathology Review will be presented 22-27 Jan 1995 at the Hyatt Regency, New Orleans, LA. This course will provide a comprehensive review of neuropathology, including basic neuropathology and recent developments in the pathophysiology of neurological disorders. This course will be especially useful to

neurologists, neurosurgeons, pathologists, and radiologists preparing for specialty examinations. Tuition ranges from \$355 to \$615.

Controversies and Recent Advances in Surgical Pathology will be presented 13-17 Feb 1995 at Disney's Contemporary Resort, Buena Vista, FL. This conference will explore recent advances in controversial areas of surgical pathology, including hepatic disease, endocrine, gastric, cardiovascular, non-Hodgkins and Hodgkins lymphoma, and neuromuscular pathology, along with infectious disease, immunohistochemistry, and radiologic-pathologic correlation. Tuition ranges from \$375 to \$750.

Respiratory Tract and Mediastinum will be presented 17-19 Feb 1995 at the Marriott Rivercenter, San Antonio, TX. The University of Texas Health Science Center at San Antonio, Wilford Hall, U.S. Air Force Medical Center, and Brooke U.S. Army Medical Center are cosponsoring this course. It is designed to give a current review of controversial topics of surgical pathology of the lower and upper respiratory tract and mediastinum. The course will consist of presentations on select topics by experts in these areas. Tuition ranges from \$315 to \$545.

For more specific information on these courses, contact the AFIP/ARP Education Division at 14th & Alaska Avenue, N.W., Washington DC 20306-6000. The phone number is 301-427-5231 and the FAX number is 301-427-5001. Internet contact is LOWTHER@email.afip.osd.mil.

Training for Excellence

CAPT James F. Bates, Special Assistant to the Surgeon General for Education and Training, presented "Training for Excellence," the Navy Medical Department strategic plan for education and training, at the Surgeon General's Leaders' Conference 5 Oct 1994.

"Training for Excellence" supports "Journey to Excellence," the strategic plan for Navy medicine, and focuses on five specific areas:

Infrastructure: Our plan provides for a single source for training policy and advocacy in order to achieve standardization and equitability throughout the training community. It provides for a central planning and analysis function to plan and program for future training requirements and to make a common data base available to all training managers. Training program management will be decentralized, placing more authority at the school-

house level for rapid response to changing requirements. Our training programs should be concentrated at areas of fleet concentration and co-located with medical treatment facilities with adequate clinical training opportunities. Schoolhouses will be built or refurbished to support quality of life for students and staff and to permit full exploitation of state-of-the-art training technology.

Technology: We will take our training to the students by means of interactive video teletraining. We will give our trainers cutting-edge technology for electronic classrooms, for automated support of curriculum development and for schoolhouse management.

Operational and Readiness Training: Operational skills and roles inventories for all corps for all platforms

will be developed by N931. The training community must assess current training to assure the curriculum is correct and the training capacity adequate to meet the requirements for all corps for all platforms.

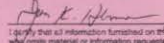
Enlisted Training: We will keep abreast of increasing professional and educational criteria in the civilian health care community and reflect those changes in our training programs. We will attract and develop instructors who are superb role models and who in turn will create a climate of learning and growth for all of our students.

Joint Medical Training: Navy medicine will be a fully cooperative participant in joint training while assuring that the requirements of our unique Navy mission are maintained.

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Navy Medicine 1945



BUMED Archives

Down the ways: LT Dema V. Leopold, chief nurse at Naval Hospital Charleston, SC, launches a new landing ship, LSM-413 as she smashes a bottle of champagne against the bow.

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